4. PREFERRED BIKEWAY CONCEPTS

Based on the environmental, transportation and engineering analysis in chapter 3, input from the Technical Advisory Committee, and the further refined conceptual alternatives, the final step in the bikeway study process was to develop a Preferred Bikeway Concept. Due to the challenges of the SR-89 corridor in terms of roadway width, topography and environmental and engineering issues, and the desire of this study to identify a bikeway that appeals to a wide range of potential users, a single Preferred Concept was not selected. Instead, several preferred bikeway concept options were identified as being desirable for development along the corridor. These preferred concepts are based on the conceptual and refined alternatives identified in Chapter 3, and specifically include the following options:

- Off-Highway Bikeway: Identifies a route that includes a combination of off-street bike paths and on-street bike routes to take riders from Meeks Bay south to Emerald Bay State Park without requiring travel on SR-89.
- On-Highway Bikeway: Identifies possible locations for widening shoulders between Spring Creek Road and Meeks Bay in order to improve safety for cyclists who choose to ride on the highway. Includes potential for "differential" shoulder widening; where right of way is restricted widen shoulders only on uphill side of road.
- Transit/Shuttle Bus: Identifies options for an improved transit system that would allow cyclists to bypass the challenging terrain of study corridor, or when combined with the bikeway options above, to combine a cycling trip with a transit trip.
- Water Ferry: Identifies options for both transit and recreational-oriented water transit as it relates to the study corridor.

Figures 4-1, 4-2, 4-3, and 4-4 on the following pages illustrate the Preferred Bikeway Concepts. The remainder of this chapter discusses each of these Preferred Bikeway Concepts in detail.

OFF-HIGHWAY BIKEWAY

This section describes the preferred Off-Highway Bikeway alignment. Based on the analysis in chapter 3, it was determined that developing an off-street bike path (Class I) along the entire corridor would not be desirable, primarily due to significant environmental and visual impacts, as well as engineering requirements and private property impacts. It was also determined that developing wide (four foot) shoulders would not be possible for the entire length of SR-89. However, there were some areas where a Class I bike path would be possible to build with minimal impacts, and there were also areas where a Class III bike route would be possible on low-traffic residential streets. Given this information, an "Off-Highway" bikeway route was proposed, one that would involve a continuous route of off-street paths (Class I) and on-street bike routes (Class III) that would allow a cyclist to avoid riding on SR-89 entirely. This route would be oriented toward the casual cyclist, focusing on providing access to major visitor destinations and maintaining an alignment with as little topographic change as possible. Based on the engineering and environmental analyses, and discussions with the Technical Advisory Committee, it was generally determined that developing an off-highway bike trail through the entire Study corridor was not possible, but that such a bikeway could feasibly be developed north of Emerald Bay State Park, starting at approximately the top of the viaduct. This section describes the Off-Highway route in detail.

SEGMENTS 1 AND 2: SPRING CREEK ROAD TO D.L. BLISS STATE PARK BOUNDARY

Based on the engineering and environmental analysis, construction of an off-street bike path from Spring Creek Road north around Emerald Bay is not considered desirable due to the environmental and visual impacts, private property impacts, and major engineering required. This is not to say such a path would not be possible to engineer and construct. However, in order to make the path attractive to family cyclists, the path would need to stay near the shoreline to avoid the significant elevation change between Spring Creek Road and Inspiration Point. This shoreline alignment would result in substantial impacts as discussed in Chapter 3.

Throughout this area there are very few options for Class III bike routes on residential roads adjacent to the highway. One roadway that was evaluated was the loop road within the Cascade Properties neighborhood. It was determined that due to the current unpaved condition of the road, the fact that the roadway is under private ownership, and the severe uphill grade toward Cascade Creek, the Cascade Properties road would not be a desirable off-highway route for the casual cyclist. Heading up from Cascade Creek toward Inspiration Point, and then down toward Vikingsholm, there are no alternative roads to SR-89 that could be used as part of the Off-Highway option.

Given this information, it was concluded that the Off-Highway Bikeway would not be possible between Spring Creek Road and Vikingsholm, effectively limiting bicycle access through these areas to SR-89 only (see the section for the On-Highway Bikeway below for a discussion of recommended on-road improvements).

However, as discussed in the following section, it was concluded that the Off-Highway Bikeway route could be possible for much of the corridor north of Emerald Bay State Park. The discussion then turned to the appropriate location for the southern terminus of this Off Highway Bikeway: would it be the Vikingsholm parking lot, or should a new location be recommended past the

Viaduct near the Emerald Bay service road? While the Vikingsholm parking lot is an existing developed facility that would be a logical stopping point for cyclists, the Viaduct segment involves a steep grade and a narrow roadway width, and cyclists that make it downhill to Vikingsholm may have difficulty getting back up the hill on the return trip.

From the Vikingsholm parking lot SR-89 climbs north at a grade of approximately 7% to 8% for approximately 4,000 feet to the gate used to close the highway during severe winter storms, periods of high avalanche potential, and snow removal operations. This section of SR-89 is the Emerald Bay viaduct. The only off-street trail option from an engineering standpoint would be to construct a second viaduct for the bike trail below the highway viaduct. The grade of this bike trail would be the same as the highway or approximately 7% to 8%. This is very steep and could pose problems for casual cyclists or bikes with inadequate brakes traveling in the downhill direction. In the uphill direction this grade may be a problem for casual cyclists. There would also be visual impacts associated with the second viaduct. In light of these issues, constructing a new off-street path parallel to the Viaduct was not considered possible.

As an alternative to an off-street path along the Viaduct, completing the off-highway connection to Vikingsholm could be provided via the Emerald Bay access road from SR-89, with the cooperation of State Parks. This option would bring cyclists down to the Vikingsholm. This roadway has an extremely steep grade, which could result in unsafe speeds by downhill cyclists and could prove difficult for uphill cyclists attempting to get back to the highway from Vikingsholm. For this reason, and given existing State Parks policy prohibiting bicycle access into Emerald Bay State Park, allowing bicyclists to use the access road is not recommended at this time. However at a minimum, terminating the off-highway bikeway at the Emerald Bay access road would provide visitors a place to lock their bikes and then hike down the road into Emerald Bay State Park and Vikingsholm.

For the above reasons, it was concluded that the southern terminus of the Off-Highway Route should be in a new location near the Emerald Bay service road. This location would involve new trailheads, a transit stop (discussed below under the Transit concept), and bike locking facilities, so that cyclists could park their bikes and either hike to Vikingsholm or catch a shuttle down the hill to the Vikingsholm parking lot. Cyclists wishing to reach the Vikingsholm parking lot on their bikes could do so via SR-89. Unless Emerald Bay State Park bike access prohibitions are revised, bicycling down to Vikingsholm via the service road would not be permitted as part of this option.

SEGMENT 3: D.L. BLISS STATE PARK BOUNDARY TO PARADISE FLAT

As noted above, a shuttle stop or trailhead located near the Emerald Bay access road would be preferred compared to the Vikingsholm parking lot location. This location would serve as the southern terminus of the Off-Highway bikeway.

Emerald Bay Service Road to D.L. Bliss Entrance

North of the Emerald Bay Service Road, SR-89 drops down at approximately a 3% grade for 1,400 feet to a low point. The grade of an off-street bike path parallel to the highway would not pose any problems for casual cyclists. The bike path alignment would be approximately 50 to 100 feet east of the highway. This area is heavily forested. This portion of bike path could follow the existing grade with a moderate amount of grading. The cross slope of the ground in this area is approximately 10%

to 15%. There would be a moderate amount of tree removal required for this portion of trail. This would result is some visual impact as viewed from the highway. This portion of trail would not be visible from Lake Tahoe.

From the low point described above the highway climbs at approximately 6% to 7% for approximately 700 feet to a high point. This high point is approximately 2,100 feet north of the southwest corner of section 16. The grade of the trail could pose problems for casual cyclists. The cross slope of the ground next to the highway in this area is a very steep fill slope transitioning to a steep cut slope. In the highway fill slope area either a retaining wall or raised bridge type structure would be required for the trail to follow the highway. In the highway cut slope area a retaining wall would be required for the trail to follow the highway. This portion of trail would be visible from the highway and may be visible from Lake Tahoe. It may be possible to design a trail farther from the highway and avoid the need for retaining walls or bridge type structures. However, the terrain in this area is fairly rugged and would require detailed topographic surveys and detailed engineering design that is beyond the scope of this report.

From the high point described above to the main entrance to D.L. Bliss State Park the highway goes up and down at moderate grades. These grades should not pose any problems for casual cyclists. The cross slopes of the ground next to the highway in this area are very steep cut and fill slopes. In the highway fill slope areas either a retaining wall or raised bridge type structure would be required for the trail to follow the highway. In the highway cut slope areas a retaining wall would be required for the trail to follow the highway. This portion of trail would be visible from the highway and may be visible from Lake Tahoe. It may be possible to design a trail farther from the highway and avoid the need for retaining walls. However, the terrain in this area is fairly rugged and would require detailed topographic surveys and detailed engineering design that is beyond the scope of this report.

Disturbance to Stream Environment Zones (SEZs) or jurisdictional wetland areas for off-highway bikeway development would require permitting/consultation with RWQCB and the US Army Corps of Engineers.

D.L. Bliss Entrance to Paradise Flat

At the D.L. Bliss State Park entrance, the Off-Highway Route would utilize the internal park entrance road (Lester Beach Road). This road would provide access to Lester Beach, and to the campground areas within the State Park. Signage warning motorists of the potential presence of bicyclists on the roadway should be installed, along with signage instructing cyclists to slow their speeds on downhill segments. The route would turn west (left) at the northern D.L. Bliss service road and head back toward SR-89. Near the intersection of SR-89 and the D.L. Bliss service road, an off-street bike path would again pick up. Specifically, this segment of bike path would start at the D.L. Bliss service road where the Balancing Rock Nature Trail intersects the service road. This is approximately 300 feet northeast of where the service road crosses Rubicon Creek. From this point on the service road, a bike path could follow the 6,360 contour on the 7.5 minute USGS quadrangle in a northerly direction for approximately 500 feet until it intersects Highway 89. A significant portion of the ground on this alignment has been previously disturbed. This portion of bike trail could easily follow the existing grade with minimal grading. The cross slope of the existing ground is nearly flat. The grade of the trail would not pose any problems for casual cyclists. There would be very little vegetation disturbance required and probably no tree removal. This portion of trail would

not be visible from Lake Tahoe. The additional coverage resulting from this trail segment would require approval from RWQCB.

Through the Paradise Flat area, a bike path could be developed parallel to SR-89 with minimal engineering, given the flat topography. Some tree removal may be necessary, and the trail would have the potential to disturb the riparian and stream environments associated with drainages found in this area; special trail design and drainage crossing techniques would be utilized to minimize environmental impacts. Disturbance to Stream Environment Zones (SEZs) or jurisdictional wetland areas for off-highway bikeway development would require permitting/consultation with RWQCB and the US Army Corps of Engineers.

Although the Paradise Flat area is primarily under private ownership, it is expected that much of the bike path alignment through this area could be developed immediately adjacent to the highway within the Caltrans right-of-way.

SEGMENT 4: PARADISE FLAT TO MEEKS BAY

Heading north from Paradise Flat area into the Rubicon Bay residential area, the SR-89 alignment begins to climb. At this point, the bike path would leave the highway right-of-way and connect into the Rubicon Bay neighborhood street network. Specifically, this section of bike path would extend from Highway 89 down to the intersection of Rubicon Drive and South Lane. This section of trail would be approximately 1,500 long. An easement through private property would be required in order to make this connection.

The highway is approximately 50 feet higher in elevation than the intersection of Rubicon Drive and South Lane. The grade of the trail would be approximately 3%. This grade should not pose any problems for casual cyclists. This section of trail would traverse a slope with a cross slope of approximately 25%. The slope has a thick cover of manzanita that is approximately five feet tall. There are also scattered fir trees on the slope. It is likely that the trail could be aligned to avoid the need to remove more than a few of these trees. This section of trail would be visible from Lake Tahoe. The cut and fill slopes and manzanita removal would increase the visibility of the trail.

Through the Rubicon Bay neighborhood, the Off-Highway Bikeway would exist as a Class III on-street bike route. The bikeway could stay on neighborhood streets the entire way to the Meeks Bay campground. Through this area, directional signage would be necessary, as the street network curves and intersects several other roadways. In the area between Victoria Circle and Rubicon Drive, acquisition of an easement onto existing private roads should be explored in order to provide a more direct bikeway alignment through this gap.

The north terminus of the on-street portion would be Meeks Avenue, which dead-ends just south of the Meeks Bay Campground. At the end of Meeks Avenue there is a chain link fence with an opening that allows pedestrian access. At the terminus, a bike path could continue in a westerly direction to the Meeks Bay Campground. There are barrier posts on both sides of the opening that would preclude horses and motorcycles from passing through the opening. Bicycles could pass with some difficulty. There is an existing footpath leading down from this opening to the eastern limits of the Meeks Bay Campground.

From the opening in the fence the trail drops approximately 20 feet to 30 feet in elevation in a horizontal distance of approximately 200 feet. This is a longitudinal grade of 10% to 15%. The bike path in this area would most likely follow this alignment. The 10% to 15% grade would pose a problem for casual cyclists. However, the overall distance and grade change is relatively small. In the uphill direction casual cyclists could dismount and walk this short distance if necessary. In the downhill direction the trail could be flat and in a straight alignment to allow cyclist with inadequate brakes to recover. Alternatively, cyclists with inadequate brakes could dismount and walk this short section. The cross slope of the ground in this area is approximately 20% to 25%. There would be a moderate amount of tree removal required for this portion of trail. This portion of trail would be visible from Lake Tahoe. This would result in some visual impact as viewed from Lake Tahoe. From the bottom of this steep section the trail could go through the Meeks Bay Campground at nearly flat grades with minimal grading and no tree removal.

The Meeks Bay Resort and Marina is currently operated by the Washoe Tribe under a lease from the US Forest Service. The Washoe Tribe has indicated that they would prefer that any bikeway alignment through this area be constructed parallel to SR-89, preferably within the highway right-of-way, rather than extending through the Marina area. Specific alignment of a bikeway through Meeks Bay would need to be taken into account during the detailed trail planning process. In general, though, a designated bicycle connection into the Meeks Bay Marina area would be highly desirable, as this area is a popular visitor destination on the West Shore. Meeks Bay would be a likely end point of bicycle trips south from Tahoe City, or for cyclists continuing south toward Emerald Bay, Meeks Bay would be a logical place to stop, rest, get water or a snack at the concession stand. If the bikeway were constructed through the Resort and Marina area, directional signage would be necessary.

The northern limit of this bikeway study is Meeks Bay; however, full success of the Off-Highway Bikeway would require that the existing West Shore bikeway be extended south from its current terminus to Meeks Bay, as planned by the TCPUD.

ON-HIGHWAY BIKEWAY

For the On-Highway Bikeway option, SR-89 was evaluated for its ability to accommodate on-street bicycle facilities. In this case, 4-foot shoulders were assumed to be the desirable treatment. It was concluded that striped and stenciled bike lanes were not appropriate for the corridor for several reasons discussed in chapter 3. For cyclists along SR-89, the key feature would be to ensure the maximum distance between the edge line (fog line) and the roadway edge, which could be accomplished simply through wider shoulders. The more shoulder width available, the better separation between the cyclist and motorists.

In terms of the On-Street Bikeway, the recommended preferred concept would be to develop a four-foot shoulder width along the study corridor where possible, with the exception of the Emerald Bay area. Based on the field review of highway width and topographic conditions, it is clear that installing a four-foot shoulder will not be possible along all segments of the SR-89 alignment. In some cases, particularly the switchbacks and moraine ridge, it may be difficult to get any additional shoulder without significant engineering or cut fill. Around Emerald Bay, a reduced shoulder width is recommended regardless of available highway width, due to parking problems within this area.